



45

1

SEQUENCE LISTING

<110> COUTURE, FRANCE
HAMEL, JOSEE
BRODEUR, BERNARD R.
MARTIN, DENIS

<120> NOVEL CHLAMYDIA ANTIGENS AND CORRESPONDING DNA
FRAGMENTS

<130> BIOVAC-15

<140> 10/022,832

<141> 2001-12-20

<150> 60/256,941

<151> 2000-12-21

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<170> PatentIn Ver. 2.1

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<212> DNA

<213> Chlamydia pneumoniae

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 Glu Thr Glu Tyr Glu Glu Lys Met Ala Glu Val Gln Lys Leu Val Phe
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 Glu Lys Lys Ser Lys Glu Asn Leu Ser Leu Ala Glu Lys Phe Leu Lys
 115 120 125
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 Pro Ser Ala Leu Leu His Tyr Lys Gly Ser Phe Ile Asn Gly Gln Val
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 Phe Ser Ser Ser Glu Gly Asn Asn Glu Pro Ile Leu Leu Pro Leu Gly
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 Gly Gln Leu Pro Pro Asn Ser Leu Leu Ile Phe Glu Ile Asn Leu Ile
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<213> Chlamydia pneumoniae

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<213> Chlamydia pneumoniae

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<212> DNA
<213> Chlamydia pneumoniae

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<213> Chlamydia pneumoniae

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      20             25             30

Met Lys Glu Met Pro Arg Ser Leu Asp Pro Gly Lys Thr Arg Leu Ile
 35             40             45

Ala Asp Gln Thr Leu Met Arg His Leu Tyr Glu Gly Leu Val Glu Glu
 50             55             60
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Lys	Glu	Ile 115	Leu	Lys	Glu	Asp	Ala 120	Ser	Ser	Val	Tyr	Leu 125	Tyr	Ala	Phe
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 Phe Ile Asp Pro Met Ser Tyr Leu Met Ile Phe Ala Asn Pro Gly Gly
 435 440 445
 Ile Ser Pro Tyr His Leu Gln Asp Ser His Phe Gln Thr Leu Leu Ile
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 465 470 475 480
 Glu Ala Leu Asp Tyr Leu Glu His Cys His Ile Leu Glu Pro Leu Cys
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<210> 7

<211> 1173

<212> DNA

<213> Chlamydia pneumoniae

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 <213> Chlamydia pneumoniae

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 Thr Ala Leu Glu Lys Met Lys Gln Glu Ala Gln Lys Ala Glu Ser Glu
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<210> 9

<211> 1979

<212> DNA

<213> *Chlamydia pneumoniae*

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<212> PRT

<213> *Chlamydia pneumoniae*

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Lys Asp Ser Glu Thr Leu Thr Val Ser Asp Ala Thr Thr Tyr Ile Ala
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Glu His Gly Lys Ser Thr Ala Ser Leu Thr Ser Lys Leu Ser Lys Phe
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Val Arg Asn Tyr Ile Asp Val Ser Arg Phe Arg Gly Leu Ala Ile Phe
 115 120 125

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Phe Leu Gly Gln Val Val Ala Ile Arg Val Ser Arg Asp Leu Arg Gln
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Asp Tyr Phe Lys Ala Leu Gln Gln Leu Pro Met Thr Phe Phe His Asp
 165 170 175

His Asp Ile Gly Asn Leu Ser Asn Arg Val Met Thr Asp Ser Ala Ser
 180 185 190

Ile Ala Leu Ala Val Asn Ser Leu Met Ile Asn Tyr Ile Gln Ala Pro
 195 200 205

Ile Thr Phe Ile Leu Thr Leu Gly Val Cys Leu Ser Ile Ser Trp Lys
 210 215 220

Phe Ser Ile Leu Ile Cys Val Ala Phe Pro Ile Phe Ile Leu Pro Ile
 225 230 235 240

Val	Val	Ile	Ala	Arg	Lys	Ile	Lys	Asn	Leu	Ala	Lys	Arg	Ile	Gln	Lys	
				245					250					255		
Ser	Gln	Asp	Ser	Phe	Ser	Ser	Val	Leu	Tyr	Asp	Phe	Leu	Ala	Gly	Val	
			260					265					270			
Met	Thr	Val	Lys	Val	Phe	Arg	Thr	Glu	Lys	Phe	Ala	Phe	Thr	Lys	Tyr	
		275					280					285				
Cys	Glu	His	Asn	Asn	Lys	Ile	Ser	Ala	Leu	Glu	Glu	Lys	Ser	Ala	Ala	
	290					295					300					
Tyr	Gly	Leu	Leu	Pro	Arg	Pro	Leu	Leu	His	Thr	Ile	Ala	Ser	Leu	Phe	
305					310					315					320	
Phe	Ala	Phe	Val	Val	Val	Ile	Gly	Ile	Tyr	Lys	Phe	Ala	Ile	Pro	Pro	
				325					330					335		
Glu	Glu	Leu	Ile	Val	Phe	Cys	Gly	Leu	Leu	Tyr	Leu	Ile	Tyr	Asp	Pro	
			340					345					350			
Ile	Lys	Lys	Phe	Gly	Asp	Glu	Asn	Thr	Ser	Ile	Met	Arg	Gly	Cys	Ala	
		355					360					365				
Ala	Ala	Glu	Arg	Phe	Tyr	Glu	Val	Leu	Asn	His	Pro	Asp	Leu	His	Ser	
		370				375					380					
Gln	Lys	Glu	Arg	Glu	Ile	Glu	Phe	Leu	Gly	Leu	Ser	Asn	Thr	Ile	Thr	
385					390					395					400	
Phe	Glu	Asn	Val	Ser	Phe	Gly	Tyr	Gln	Glu	Asp	Lys	His	Ile	Leu	Lys	
			405						410					415		
Asn	Leu	Ser	Phe	Thr	Leu	His	Lys	Gly	Glu	Ala	Leu	Gly	Ile	Val	Gly	
			420					425					430			
Pro	Thr	Gly	Ser	Gly	Lys	Thr	Thr	Leu	Val	Lys	Leu	Leu	Pro	Arg	Leu	
		435					440					445				
Tyr	Glu	Val	Ser	Gln	Gly	Lys	Ile	Leu	Ile	Asp	Ser	Leu	Pro	Ile	Thr	
	450					455				460						
Glu	Tyr	Asn	Lys	Gly	Ser	Leu	Arg	Asn	His	Ile	Ala	Cys	Val	Leu	Gln	
465					470					475					480	
Asn	Pro	Phe	Leu	Phe	Tyr	Asp	Thr	Val	Trp	Asn	Asn	Leu	Thr	Cys	Gly	
				485					490					495		
Lys	Asp	Met	Glu	Glu	Glu	Ala	Val	Leu	Glu	Ala	Leu	Lys	Arg	Ala	Tyr	
			500					505					510			
Ala	Asp	Glu	Phe	Ile	Leu	Lys	Leu	Pro	Lys	Gly	Val	His	Ser	Val	Leu	
		515					520					525				
Glu	Glu	Ser	Gly	Lys	Asn	Leu	Ser	Gly	Gly	Gln	Gln	Gln	Arg	Leu	Ala	
	530					535					540					

Ile Ala Arg Ala Leu Leu Lys Asn Ala Ser Ile Leu Ile Leu Asp Glu
545 550 555 560

Ala Thr Ser Ala Leu Asp Ala Ile Ser Glu Asn Tyr Ile Lys Asn Ile
565 570 575

Ile Gly Glu Leu Lys Gly Gln Cys Thr Gln Ile Ile Ile Ala His Lys
580 585 590

Leu Thr Thr Leu Glu His Val Asp Arg Val Leu Tyr Ile Glu Asn Gly
595 600 605

Gln Lys Ile Ala Glu Gly Thr Lys Glu Glu Leu Leu Gln Thr Cys Pro
610 615 620

Glu Phe Leu Lys Met Trp Glu Leu Ser Gly Thr Lys Glu Tyr Asn Arg
625 630 635 640

Val Phe Val Pro Asp His Lys Leu Val Ala Asn Pro Thr Asp Met Ala
645 650 655

Ile Thr Thr

<210> 11

<211> 450

<212> DNA

<213> Chlamydia pneumoniae

<400> 11

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agatctgtta tagcagctat cattgctgtt gtagctatct cttactcgg actaggtctt 180
gtagttcttg ctggttgctg tccttttagga atggctgcgg gtgctataac aatgctgctg 240
ggtgtagcat tattagcttg ggcaatactg attactttga gactgcttaa tatacctaag 300
gctgaaatac cgagtccagg gaacaacggt gagcctaag aaagaaattc agcaactcct 360
cctctagagg gtggtgttgc aggagaagcc ggtcgcggcg ggggggtcacc tttaacccaa 420
cttgatctca attcaggggc gggaagttag 450
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<210> 12

<211> 149

<212> PRT

<213> Chlamydia pneumoniae

<400> 12

Met Ala Val Gln Ser Ile Lys Glu Ala Val Thr Ser Ala Ala Thr Ser
1 5 10 15

Val Gly Cys Val Asn Cys Ser Arg Glu Ala Ile Pro Ala Phe Asn Thr
20 25 30

Glu Glu Arg Ala Thr Ser Ile Ala Arg Ser Val Ile Ala Ala Ile Ile
35 40 45

Ala Val Val Ala Ile Ser Leu Leu Gly Leu Gly Leu Val Val Leu Ala
50 55 60

Gly Cys Cys Pro Leu Gly Met Ala Ala Gly Ala Ile Thr Met Leu Leu
65 70 75 80

Gly Val Ala Leu Leu Ala Trp Ala Ile Leu Ile Thr Leu Arg Leu Leu
85 90 95

Asn Ile Pro Lys Ala Glu Ile Pro Ser Pro Gly Asn Asn Gly Glu Pro
100 105 110

Asn Glu Arg Asn Ser Ala Thr Pro Pro Leu Glu Gly Gly Val Ala Gly
115 120 125

Glu Ala Gly Arg Gly Gly Gly Ser Pro Leu Thr Gln Leu Asp Leu Asn
130 135 140

Ser Gly Ala Gly Ser
145

<210> 13

<211> 486

<212> DNA

<213> Chlamydia pneumoniae

<400> 13

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tcaaaaagtg ttgtcccttt taagaaaagt ctttcggatg cgccccgtgt tgtgtgctcg 120
atttttagttt tgactctggg gttgggagcg cttgtttgtg gtattgccat tacttgttgg 180
tgtgtcccg gaggttatattt aatgggggga atttgcgcta tagttttagg tgcaatttct 240
ttagctttaa gtctattttg gttgtggggg ttattttcta attgttggtg ttctaagaga 300
gttttaccgg gtgaggggatt gctacgggat aagcttttag atggtggatt ttcaagagcg 360
gcaccttcag gaatgggact tccgggtgat ggatctccaa gagcgtcaac gccatcttgc 420
ctagagggaac ttcaagcaga gatacaggca gttactcaag ctatcgatca gatgtcagat 480
gattga 486
```

<210> 14

<211> 161

<212> PRT

<213> Chlamydia pneumoniae

<400> 14

Met Ser Ser Ser Glu Val Val Phe Gln Thr Val His Gly Leu Gly Phe
1 5 10 15

Gly Gly Leu Ser Ser Lys Ser Val Val Pro Phe Lys Lys Ser Leu Ser
20 25 30

Asp Ala Pro Arg Val Val Cys Ser Ile Leu Val Leu Thr Leu Gly Leu
35 40 45

Gly Ala Leu Val Cys Gly Ile Ala Ile Thr Cys Trp Cys Val Pro Gly
50 55 60

Val Ile Leu Met Gly Gly Ile Cys Ala Ile Val Leu Gly Ala Ile Ser
65 70 75 80

```
<210> 15
<211> 1170
<212> DNA
<213> Chlamydia pneumoniae
```

<400> 15						
atgggaactc	ctatatctgg	caatgatggt	gaccgtaata	cgatatcaga	tccttttagaa	60
gaaagtgccg	cagaagaggg	ggattcagat	ttagaggatc	gggtatcgga	aagtgctacc	120
caagtgatag	aaaccatagc	ggatacgggg	atcccagaag	caactccatc	tgaagggtacg	180
aatactgtatt	taaatagcga	ccttgtatag	agagtagaat	atgaagctcg	cggaagcctg	240
ttaactacga	tgcttgccgc	gattcgtaaa	gcagtagatc	agatttggat	gcagtgtaaa	300
acaaaaacgc	atccaaaaga	acagggagtg	cgcttccttg	gggacatccc	ttgtgatctt	360
ctcaaagcaa	cgcgactccc	taaagaaact	cgcgaaacct	catactttta	tgcttttagaa	420
acagcactag	cttcatgccg	aagctttttc	tttcatgtat	ttttaaggct	attcactctt	480
ttacgtcgtc	aacaccacga	ggctccctta	gacctttgtg	gtacagatcc	tataagtcca	540
gaagctgcag	ttgcattttg	tttaatctta	cgttcttgtg	gcaagtgggt	agctacggac	600
gcagttcaag	aaggactgcc	tttagaagtc	atcgaagagg	caggaatgta	taatgcgttt	660
tcctttagaag	ctacaacaac	agtagaagaa	gtctccaaaa	ggctctccga	actattatac	720
ctcagacaac	gtattgtatg	gttagctaac	gtccgtggga	ttactaagat	aattacctct	780
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ggtcgtaact	atactcaggt	acttgccctgt	gcctcccaaa	ttgatgagtt	tgccgataaa	900
ggagagaacg	aagctctcgt	tatgaaagac	atcctctatt	tagtacgtca	agatcgtagc	960
aaagagctcg	gagacttttt	aatgatgtgg	tcagaagagc	acgcctcaga	agtaaactat	1020
gatgtcgctt	tcgctattct	agaagtaaat	ctccctatct	tagaagaaga	ctatcgctcg	1080
catcccatag	catatcagaa	gaaattaaac	tatgtgatct	gtcagttttt	ctgtagcgag	1140
cgctcgacat	caatagagcc	caagaactag				1170

```
<210> 16
<211> 389
<212> PRT
<213> Chlamydia pneumoniae
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```

<400> 16
Met Gly Thr Pro Ile Ser Gly Asn Asp Gly Asp Arg Asn Thr Ile Ser
  1           5           10           15

Asp Pro Leu Glu Glu Ser Ala Ala Glu Glu Gly Asp Ser Asp Leu Glu
      20           25           30

```

Asp Arg Val Ser Glu Ser Ala Thr Gln Val Ile Glu Thr Ile Ala Asp
 35 40 45
 Thr Gly Ile Pro Glu Ala Thr Pro Ser Glu Gly Thr Asn Ser Asp Leu
 50 55 60
 Asn Ser Asp Leu Val Asp Arg Val Glu Tyr Glu Ala Arg Gly Ser Leu
 65 70 75 80
 Leu Thr Thr Met Leu Ala Arg Ile Arg Lys Ala Val Ser Gln Ile Trp
 85 90 95
 Met His Val Lys Thr Lys Arg His Pro Lys Glu Gln Gly Val Arg Ser
 100 105 110
 Leu Gly Asp Ile Pro Cys Asp Leu Leu Lys Ala Thr Arg Leu Pro Lys
 115 120 125
 Glu Thr Ala Glu Pro Pro Tyr Phe Tyr Ala Leu Glu Thr Ala Leu Ala
 130 135 140
 Ser Cys Arg Ser Phe Phe Phe His Val Phe Leu Arg Leu Phe Thr Leu
 145 150 155 160
 Leu Arg Arg Gln His Pro Glu Ala Pro Leu Asp Leu Cys Gly Thr Asp
 165 170 175
 Pro Ile Ser Pro Glu Ala Ala Val Ala Phe Ala Leu Ile Leu Arg Ser
 180 185 190
 Cys Cys Lys Trp Val Ala Thr Asp Ala Val Gln Glu Gly Leu Pro Leu
 195 200 205
 Glu Val Ile Glu Glu Ala Gly Met Tyr Asn Ala Phe Ser Leu Glu Ala
 210 215 220
 Thr Thr Thr Val Glu Glu Val Ser Lys Arg Leu Ser Glu Leu Leu Tyr
 225 230 235 240
 Ser Asp Lys Arg Ile Asp Gly Leu Ala Asn Val Arg Gly Ile Thr Lys
 245 250 255
 Ile Ile Thr Ser Pro Tyr Leu Gly Ala Gly Gln Cys Val Ser Val Val
 260 265 270
 Asp Asn Leu Lys Thr Tyr Asp Leu Gly Arg Asn Tyr Thr Gln Val Leu
 275 280 285
 Ala Cys Ala Ser Gln Ile Asp Glu Phe Ala Asp Lys Gly Glu Asn Glu
 290 295 300
 Ala Leu Val Met Lys Asp Ile Leu Tyr Leu Val Arg Gln Asp Arg Ser
 305 310 315 320
 Lys Glu Leu Gly Asp Phe Leu Met Met Trp Ser Glu Glu His Ala Ser
 325 330 335

Glu Val Asn Tyr Asp Val Val Leu Ala Ile Leu Glu Val Asn Leu Pro
 340 345 350

Ile Leu Glu Glu Asp Tyr Arg Ser His Pro Leu Ala Tyr Gln Lys Lys
 355 360 365

Leu Asn Tyr Val Ile Cys Gln Phe Phe Cys Ser Glu Arg Leu Thr Ser
 370 375 380

Ile Glu Pro Lys Asp
 385

<210> 17

<211> 1035

<212> DNA

<213> Chlamydia pneumoniae

<400> 17

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gtcgttcctg aacttgcttc aagagcacat ctccatatct tcccacaagt gataaataaa 180
gctctacaac aggccaactt attgatcgaa gatatggatc tgattgcagt aacgcaaact 240
ccagggttga taggttctct atcagtagga gtgcattttg gtaaaggcat tgccatagga 300
gcaaaaaaat ccttgattgg agtcaatcac gtcgaagctc atctctatgc tgcctatatg 360
gcagcgcaaa acgtgcaatt ccctgcttta ggtcttgtgg tctctggagc tcataccgca 420
gcgtttttta tagaaaatcc tacatcctat aaactcatag gaaaaactcg agatgatgct 480
ataggagaaa cttttgataa agtaggacgc tttctaggat taccataccc tgcaggccca 540
ttaattgaaa aactcgcttt agaaggctct gaggacagtt atccttttag tccagctaaa 600
gtcccaaact atgacttttc attcagcggg cttaaaacag ctgttctcta cgcaatcaaa 660
ggaaataata gtagcccccg ctctcctgct ccagagatat ctttagaaaa acaaagagat 720
atcgctgctt catttcaaaa agcggcctgc actactattg cacaaaaact tcccactatt 780
ataaaagaat tttcgtgccg atctatactt attggagggt gcgtagccat taatgaatac 840
tttagatccg caatacaaac tgcgtgtaat ctacctgtat acttcccccc tgctaaacta 900
tgctcagata atgctgctat gattgcaggt ctagggggag aaaattttca aaaaaactct 960
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```

<210> 18

<211> 344

<212> PRT

<213> Chlamydia pneumoniae

<400> 18

Met Leu Thr Leu Gly Leu Glu Ser Ser Cys Asp Glu Thr Ala Cys Ala
 1 5 10 15

Ile Val Asn Glu Asp Lys Gln Ile Leu Ala Asn Ile Ile Ala Ser Gln
 20 25 30

Asp Ile His Ala Ser Tyr Gly Gly Val Val Pro Glu Leu Ala Ser Arg
 35 40 45

Ala His Leu His Ile Phe Pro Gln Val Ile Asn Lys Ala Leu Gln Gln
 50 55 60

Ala	Asn	Leu	Leu	Ile	Glu	Asp	Met	Asp	Leu	Ile	Ala	Val	Thr	Gln	Thr		
65					70					75					80		
Pro	Gly	Leu	Ile	Gly	Ser	Leu	Ser	Val	Gly	Val	His	Phe	Gly	Lys	Gly		
				85					90					95			
Ile	Ala	Ile	Gly	Ala	Lys	Lys	Ser	Leu	Ile	Gly	Val	Asn	His	Val	Glu		
			100					105					110				
Ala	His	Leu	Tyr	Ala	Ala	Tyr	Met	Ala	Ala	Gln	Asn	Val	Gln	Phe	Pro		
		115					120					125					
Ala	Leu	Gly	Leu	Val	Val	Ser	Gly	Ala	His	Thr	Ala	Ala	Phe	Phe	Ile		
	130					135					140						
Glu	Asn	Pro	Thr	Ser	Tyr	Lys	Leu	Ile	Gly	Lys	Thr	Arg	Asp	Asp	Ala		
145					150					155					160		
Ile	Gly	Glu	Thr	Phe	Asp	Lys	Val	Gly	Arg	Phe	Leu	Gly	Leu	Pro	Tyr		
				165				170						175			
Pro	Ala	Gly	Pro	Leu	Ile	Glu	Lys	Leu	Ala	Leu	Glu	Gly	Ser	Glu	Asp		
			180					185					190				
Ser	Tyr	Pro	Phe	Ser	Pro	Ala	Lys	Val	Pro	Asn	Tyr	Asp	Phe	Ser	Phe		
		195					200					205					
Ser	Gly	Leu	Lys	Thr	Ala	Val	Leu	Tyr	Ala	Ile	Lys	Gly	Asn	Asn	Ser		
	210					215					220						
Ser	Pro	Arg	Ser	Pro	Ala	Pro	Glu	Ile	Ser	Leu	Glu	Lys	Gln	Arg	Asp		
225					230					235					240		
Ile	Ala	Ala	Ser	Phe	Gln	Lys	Ala	Ala	Cys	Thr	Thr	Ile	Ala	Gln	Lys		
				245					250					255			
Leu	Pro	Thr	Ile	Ile	Lys	Glu	Phe	Ser	Cys	Arg	Ser	Ile	Leu	Ile	Gly		
			260					265					270				
Gly	Gly	Val	Ala	Ile	Asn	Glu	Tyr	Phe	Arg	Ser	Ala	Ile	Gln	Thr	Ala		
		275				280						285					
Cys	Asn	Leu	Pro	Val	Tyr	Phe	Pro	Pro	Ala	Lys	Leu	Cys	Ser	Asp	Asn		
	290					295					300						
Ala	Ala	Met	Ile	Ala	Gly	Leu	Gly	Gly	Glu	Asn	Phe	Gln	Lys	Asn	Ser		
305					310					315					320		
Ser	Ile	Pro	Glu	Ile	Arg	Ile	Cys	Ala	Arg	Tyr	Gln	Trp	Glu	Ser	Val		
				325					330					335			
Ser	Pro	Phe	Ser	Leu	Ala	Ser	Pro										
			340														

<210> 19

<211> 1214

<212> DNA

<213> *Chlamydia pneumoniae*

<400> 19

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aagattttcc gctaccatcc ttactaaaa attcatgata ttgctcgggc cgtctatctt 180
ttgatggcct tagaagaagg cgaggattta ggcttaagct ttttaaagt acagcagtac 240
ccttcagggt ctgtagaact gttttcttgt ggggattttc ctgggaaagg attaccttat 300
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agtcaggcat acgtctctaa aatgagtcac ttcaacagg cactctttga tcaccaaggg 420
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cttagccaat cgtttctctt ccaattagga atgcaaattc acccagaata cagtcttgag 540
gatcctgcac tagggttctg gatgcaaaga acgcgttctt catccgcttt tgtagccgct 600
tcaggatgtc aaagtagctt gggagcgtat tcctcagggg atgtcgggtg tatcgcttat 660
ggaccttgct ctggagacat tagtgattgt tattattttg gatgttggtg aatcgctaaa 720
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aagcctcatc ccagaaatac gggattttcc taccttcgag attcctatgt acatctgccg 840
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gccacctctg ccatgacgtt ttctattttt tgtaagggga agaattgtca ggttggtgac 960
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gctttgcaag gcaaagaaaa attttggaat gcagactttt tgattaatat tccttacaaa 1140
gaagagggcg tcatgttaat ttttgaaaaa aaagtgcact ctgagaaagg aagattcttt 1200
acgaagatga atta                                     1214

```

<210> 20

<211> 404

<212> PRT

<213> *Chlamydia pneumoniae*

<400> 20

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Met Gly Leu Gln Ser Arg Leu Gln His Cys Ile Glu Val Ser Gln Asn
 1              5              10              15

Ser Asn Phe Asp Ser Gln Val Lys Gln Phe Ile Tyr Ala Cys Gln Asp
      20              25              30

Lys Thr Leu Arg Gln Ser Val Leu Lys Ile Phe Arg Tyr His Pro Leu
      35              40              45

Leu Lys Ile His Asp Ile Ala Arg Ala Val Tyr Leu Leu Met Ala Leu
      50              55              60

Glu Glu Gly Glu Asp Leu Gly Leu Ser Phe Leu Asn Val Gln Gln Tyr
      65              70              75              80

Pro Ser Gly Ala Val Glu Leu Phe Ser Cys Gly Gly Phe Pro Trp Lys
      85              90              95

Gly Leu Pro Tyr Pro Ala Glu His Ala Glu Phe Gly Leu Leu Leu Leu
      100              105              110

Gln Ile Ala Glu Phe Tyr Glu Glu Ser Gln Ala Tyr Val Ser Lys Met
      115              120              125

```

Ser His Phe Gln Gln Ala Leu Phe Asp His Gln Gly Ser Val Phe Pro
 130 135 140
 Ser Leu Trp Ser Gln Glu Asn Ser Arg Leu Leu Lys Glu Lys Thr Thr
 145 150 155 160
 Leu Ser Gln Ser Phe Leu Phe Gln Leu Gly Met Gln Ile His Pro Glu
 165 170 175
 Tyr Ser Leu Glu Asp Pro Ala Leu Gly Phe Trp Met Gln Arg Thr Arg
 180 185 190
 Ser Ser Ser Ala Phe Val Ala Ala Ser Gly Cys Gln Ser Ser Leu Gly
 195 200 205
 Ala Tyr Ser Ser Gly Asp Val Gly Val Ile Ala Tyr Gly Pro Cys Ser
 210 215 220
 Gly Asp Ile Ser Asp Cys Tyr Tyr Phe Gly Cys Cys Gly Ile Ala Lys
 225 230 235 240
 Glu Phe Val Cys Gln Lys Ser His Gln Thr Thr Glu Ile Ser Phe Leu
 245 250 255
 Thr Ser Thr Gly Lys Pro His Pro Arg Asn Thr Gly Phe Ser Tyr Leu
 260 265 270
 Arg Asp Ser Tyr Val His Leu Pro Ile Arg Cys Lys Ile Thr Ile Ser
 275 280 285
 Asp Lys Gln Tyr Arg Val His Ala Ala Leu Ala Glu Ala Thr Ser Ala
 290 295 300
 Met Thr Phe Ser Ile Phe Cys Lys Gly Lys Asn Cys Gln Val Val Asp
 305 310 315 320
 Gly Pro Arg Leu Arg Ser Cys Ser Leu Asp Ser Tyr Lys Gly Pro Gly
 325 330 335
 Asn Asp Ile Met Ile Leu Gly Glu Asn Asp Ala Ile Asn Ile Val Ser
 340 345 350
 Ala Ser Pro Tyr Met Glu Ile Phe Ala Leu Gln Gly Lys Glu Lys Phe
 355 360 365
 Trp Asn Ala Asp Phe Leu Ile Asn Ile Pro Tyr Lys Glu Glu Gly Val
 370 375 380
 Met Leu Ile Phe Glu Lys Lys Val Thr Ser Glu Lys Gly Arg Phe Phe
 385 390 395 400
 Thr Lys Met Asn

<210> 21

<211> 1149

<212> DNA

<213> *Chlamydia pneumoniae*

<400> 21

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gtaactacat caacctcaca gccgcaagtt gcttctaaag caaagcagtt atggcagacg 180
gtaagggagt tcttttttagg gaagaaatca cccgattctt ctcaggggtgc ttcgggacct 240
gcaatgcaaa gtccttcagg acctacaata cggcctacgc gtccggcacc tccacctcct 300
acaacgggtg gggctaattg gaaacgtccc gcaacgcatg ggaaagggtcg agcacctcaa 360
cctcctacgg cgggggtcttc ttcaggatca gagcaacctc ctgccatgag ttctgaagtc 420
gctaaaacttg tgagtgaatt aaaagatgca gtccatagtc atgcggagtc tcaaaaagta 480
cttaaaaagg tatctcaaga gctacaaaca aagtggacgg attgggaaaa taataggggt 540
ccagactatc ttttgcattg ttatcgtgtc attgctcgag ctttgcagca aacatacaca 600
gaacaatcta tgcttatcga agggacttca tctacaggac cagttccgca agcagtgact 660
gtagctaagg atgctgtaac tcagacagtt agaggcgcaa ttaagaattt agaaaatcct 720
aagccaggta atgatcctga tgggtgtactc atgcaagtgg ttataagctt aggtatcgaa 780
ggacctacat tagaccagga agaactctatc caaaactttt tagaaactag ggtttcggat 840
ttcgggtggag atgatatgga catagattat acaagtgata tagctcgatt agggtcagct 900
ttagatcggg tacgcgaaaa tcataccta atgagatgccta gaatatggat agcattagca 960
cgagaactcg gtgcggctgt acactctcat gctacttccg tccgaatcgc aaatgcagga 1020
aagaatcaca ctcgtagcgt tgtgcgaatg gccaatgagt cgagtagact acttcaaggt 1080
atgaaagtgt tatcgggtcg agcttgggag aatacaatga cagttttaat cggggatcct 1140
tttgaataa

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<210> 22

<211> 382

<212> PRT

<213> *Chlamydia pneumoniae*

<400> 22

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Met Gly Ile Asn Pro Ser Gly Asn Arg Ser Pro Asp Asp Val Trp Val
  1                      5                      10                      15

Arg Gly Ala Gln Gly Asp Ser Ser Ser Thr Gln Gly Thr Gly Ala Thr
      20                      25                      30

Asn Ser Asn Leu Gly Ala His Asn Val Thr Thr Ser Thr Ser Gln Pro
      35                      40                      45

Gln Val Ala Ser Lys Ala Lys Gln Leu Trp Gln Thr Val Arg Glu Phe
      50                      55                      60

Phe Leu Gly Lys Lys Ser Pro Asp Ser Ser Gln Gly Ala Ser Gly Pro
      65                      70                      75                      80

Ala Met Gln Ser Pro Ser Gly Pro Thr Ile Arg Pro Thr Arg Pro Ala
      85                      90                      95

Pro Pro Pro Pro Thr Thr Gly Gly Ala Asn Ala Lys Arg Pro Ala Thr
      100                      105                      110

His Gly Lys Gly Arg Ala Pro Gln Pro Pro Thr Ala Gly Ser Ser Ser
      115                      120                      125

Gly Ser Glu Gln Pro Thr Ala Met Ser Ser Glu Val Ala Lys Leu Val
      130                      135                      140

```

Ser Glu Leu Lys Asp Ala Val His Ser His Ala Glu Ser Gln Lys Val
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 165 170 175
 Asn Asn Arg Gly Pro Asp Tyr Leu Leu His Gly Tyr Arg Val Ile Ala
 180 185 190
 Arg Ala Leu Gln Gln Thr Tyr Thr Glu Gln Ser Met Leu Ile Glu Gly
 195 200 205
 Thr Ser Ser Thr Gly Pro Val Pro Gln Ala Val Thr Val Ala Lys Asp
 210 215 220
 Ala Val Thr Gln Thr Val Arg Gly Ala Ile Lys Asn Leu Glu Asn Pro
 225 230 235 240
 Lys Pro Gly Asn Asp Pro Asp Gly Val Leu Met Gln Val Val Ile Ser
 245 250 255
 Leu Gly Ile Glu Gly Pro Thr Leu Asp Pro Gly Glu Ser Ile Gln Asn
 260 265 270
 Phe Leu Glu Thr Arg Val Ser Asp Phe Gly Gly Asp Asp Ser Asp Ile
 275 280 285
 Asp Tyr Thr Ser Asp Ile Ala Arg Leu Gly Ser Ala Leu Asp Arg Val
 290 295 300
 Arg Glu Asn His Pro Asn Glu Met Pro Arg Ile Trp Ile Ala Leu Ala
 305 310 315 320
 Arg Glu Leu Gly Ala Ala Val His Ser His Ala Thr Ser Val Arg Ile
 325 330 335
 Ala Asn Ala Gly Lys Asn His Thr Arg Asp Val Val Arg Met Ala Asn
 340 345 350
 Glu Ser Ser Arg Leu Leu Gln Gly Met Lys Val Leu Ser Val Gly Ala
 355 360 365
 Trp Ala Asn Thr Met Thr Val Leu Ile Gly Asp Leu Phe Glu
 370 375 380

<210> 23

<211> 1122

<212> DNA

<213> *Chlamydia pneumoniae*

<400> 23

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 ccttaccttt atcgcttctt tgagatcata tgggggtgttg tgaaatttct tctcggtta 180
 atcttcttta ttcccttggg tcttttctgg gtccttcaga agatatgtca gaattttatt 240
 cttcttggtg caggagggtg gatttttaga cccatatgca gggactctaa tttattgcga 300

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caagcttacg ccgcgcgtct tttctccgct tcattccaag atcatgtctc ctctgtgcga 360
agggtttgct tacagtatga cgaggtcttt attgacggat tggagttacg tcttcccaat 420
gctaagccag atcgatggat gttaatctcc aatggaaact ccgattgctt agagtatagg 480
acagtgtctg aaggggaaaa ggactggata ttccgtattg ctgaagagtc tcaatccaac 540
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gtagtcaaat cttatcaagc atgcgtacgc tatcttagag atgaaccgcg aggacctcag 660
gcgcgtcaaa tcggttgctta tggctattct ttaggagcta gtgttcaagc cgaagcatta 720
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gctcgtctta caggagccgt tgctaaacag tttattggaa gtctaggagt ttggctggcg 840
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aaaatccctg tagctcagac cggcttaaga cacgatcata tcctttccga tgatgtgatt 1080
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<210> 24

<211> 373

<212> PRT

<213> *Chlamydia pneumoniae*

<400> 24

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Met Ser Ile Ala Ile Ala Arg Glu Gln Tyr Ala Ala Ile Leu Asp Met
  1             5             10             15

His Pro Lys Pro Ser Ile Ala Met Phe Ser Ser Glu Gln Ala Arg Thr
          20             25             30

Ser Trp Glu Lys Arg Gln Ala His Pro Tyr Leu Tyr Arg Leu Leu Glu
          35             40             45

Ile Ile Trp Gly Val Val Lys Phe Leu Leu Gly Leu Ile Phe Phe Ile
          50             55             60

Pro Leu Gly Leu Phe Trp Val Leu Gln Lys Ile Cys Gln Asn Phe Ile
          65             70             75             80

Leu Leu Gly Ala Gly Gly Trp Ile Phe Arg Pro Ile Cys Arg Asp Ser
          85             90             95

Asn Leu Leu Arg Gln Ala Tyr Ala Ala Arg Leu Phe Ser Ala Ser Phe
          100             105             110

Gln Asp His Val Ser Ser Val Arg Arg Val Cys Leu Gln Tyr Asp Glu
          115             120             125

Val Phe Ile Asp Gly Leu Glu Leu Arg Leu Pro Asn Ala Lys Pro Asp
          130             135             140

Arg Trp Met Leu Ile Ser Asn Gly Asn Ser Asp Cys Leu Glu Tyr Arg
          145             150             155             160

Thr Val Leu Gln Gly Glu Lys Asp Trp Ile Phe Arg Ile Ala Glu Glu
          165             170             175

Ser Gln Ser Asn Ile Leu Ile Phe Asn Tyr Pro Gly Val Met Lys Ser
          180             185             190

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Gln Gly Asn Ile Thr Arg Asn Asn Val Val Lys Ser Tyr Gln Ala Cys
 195 200 205
 Val Arg Tyr Leu Arg Asp Glu Pro Ala Gly Pro Gln Ala Arg Gln Ile
 210 215 220
 Val Ala Tyr Gly Tyr Ser Leu Gly Ala Ser Val Gln Ala Glu Ala Leu
 225 230 235 240
 Ser Lys Glu Ile Ala Asp Gly Ser Asp Ser Val Arg Trp Phe Val Val
 245 250 255
 Lys Asp Arg Gly Ala Arg Ser Thr Gly Ala Val Ala Lys Gln Phe Ile
 260 265 270
 Gly Ser Leu Gly Val Trp Leu Ala Asn Leu Thr His Trp Asn Ile Asn
 275 280 285
 Ser Glu Lys Arg Ser Lys Asp Leu His Cys Pro Glu Leu Phe Ile Tyr
 290 295 300
 Gly Lys Asp Ser Gln Gly Asn Leu Ile Gly Asp Gly Leu Phe Lys Lys
 305 310 315 320
 Glu Thr Cys Phe Ala Ala Pro Phe Leu Asp Pro Lys Asn Leu Glu Glu
 325 330 335
 Cys Ser Gly Lys Lys Ile Pro Val Ala Gln Thr Gly Leu Arg His Asp
 340 345 350
 His Ile Leu Ser Asp Asp Val Ile Lys Glu Val Ala Gly His Ile Gln
 355 360 365
 Arg His Phe Asp Asn
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<210> 25

<211> 1215

<212> DNA

<213> *Chlamydia pneumoniae*

<400> 25

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aaaattgtca ccctcacact agccctagcg tgcgctttgg gcttttagcat tgctgctggc 180
atcttggtca tgcctatattt ttctgccgta gttgtcataa cattagcaat tgctgctggc 240
tcactttact cccttttaaa gaaacctaata ttatacgaga ttcttctcctca aatcgaaccc 300
gaatctgagc aaagtctctct gtctccctct cccagcctc ctgagcaaca ggacctccct 360
ttgcagatcg atccacttcc cgatcccgaa tcactccccg aagtctctct tgctgatcta 420
accacacccc cagaagaact taccgctatc acggtcactc ctggctatga ggctcttctt 480
gaacaaaact gggatcttct tccgagctta gccgctgtag acccatcggt tactacagaa 540
acacctcagc agccctgttt tatttggaag cttaaagact cgaagcttat ctttatatct 600
acctcaggag atattgcagt tccaagaatc aaaactcaag gcagggtgat gattgttaac 660
gcagcaaacg agaacatctc ccgagaagga gggggaacga ataaagctct atccctggct 720
acaagtctac agtggttgaa cgcacttagg ctccctagag cgcactctcg ttctggatcc 780
caactacagc caggagaatg ccgctcagca aaatgggaaa atagtgatca cacctcaaac 840
gaccatgtcc caggcaaagc acacttctta gcacaactgc ttggtcccga agctgctaag 900

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tgtaacaacg atcctaagca agcatttgaa gtaagcaaga aagcgtttca taacctgttc 960
caagaagctg aaatcatagg cgttgatgtg attcaactcc ccctcattgg atgtaatcta 1020
tttgctccat caagacttct aaacctcggg aaaacaagag cagaatggat cgaggctata 1080
aaattggcac tcatcacatc tcttcaagat tttggatggg aacaagacaa ccaggaagag 1140
caaaaaatta tcatccttac agacaaggac cagcctccca tcattccacc ccgtttcgat 1200
ctaacgactc cctag                                     1215

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<210> 26

<211> 404

<212> PRT

<213> Chlamydia pneumoniae

<400> 26

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Met Thr Asp Ser Asn Pro Leu Pro Ser Tyr Thr Asp Ala Ser Leu Tyr
 1              5              10              15

Arg Thr Pro Ala Lys His Ser Tyr Pro Ile Arg Leu Pro Leu Asn Arg
      20              25              30

Thr Asp Arg Ile Glu Lys Ile Leu Lys Ile Val Thr Leu Thr Leu Ala
      35              40              45

Leu Ala Cys Ala Leu Gly Phe Ser Ile Ala Ala Gly Ile Leu Ala Met
      50              55              60

Pro Ile Phe Ser Ala Val Val Val Ile Thr Leu Ala Ile Ala Ala Val
      65              70              75              80

Ser Leu Tyr Ser Leu Leu Lys Lys Pro Lys Leu Tyr Glu Ile Leu Pro
      85              90              95

Gln Ile Glu Pro Glu Ser Glu Gln Ser Ser Leu Ser Pro Ser Pro Gln
      100              105              110

Pro Pro Glu Gln Gln Asp Leu Pro Leu Gln Ile Asp Pro Leu Pro Asp
      115              120              125

Pro Glu Ser Leu Pro Glu Val Ser Leu Ala Asp Leu Thr Thr Pro Pro
      130              135              140

Glu Glu Leu Thr Ala Ile Thr Val Thr Pro Gly Tyr Glu Ala Leu Leu
      145              150              155              160

Glu Gln Asn Trp Asp Leu Leu Pro Ser Leu Ala Ala Val Asp Pro Ser
      165              170              175

Phe Thr Thr Glu Thr Pro Gln Gln Pro Cys Phe Ile Trp Lys Leu Lys
      180              185              190

Asp Ser Lys Leu Ile Phe Ile Ser Thr Ser Gly Asp Ile Ala Val Pro
      195              200              205

Arg Ile Lys Thr Gln Gly Arg Val Met Ile Val Asn Ala Ala Asn Glu
      210              215              220

Asn Ile Ser Arg Glu Gly Gly Gly Thr Asn Lys Ala Leu Ser Leu Ala
      225              230              235              240

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Thr Ser Leu Gln Cys Trp Asn Ala Ser Arg Leu Pro Arg Ala His Ser
 245 250 255
 Arg Ser Gly Ser Gln Leu Gln Pro Gly Glu Cys Arg Ser Ala Lys Trp
 260 265 270
 Glu Asn Ser Asp His Thr Ser Asn Asp His Val Pro Gly Lys Ala His
 275 280 285
 Phe Leu Ala Gln Leu Leu Gly Pro Glu Ala Ala Lys Cys Asn Asn Asp
 290 295 300
 Pro Lys Gln Ala Phe Glu Val Ser Lys Lys Ala Phe His Asn Leu Phe
 305 310 315 320
 Gln Glu Ala Glu Ile Ile Gly Val Asp Val Ile Gln Leu Pro Leu Ile
 325 330 335
 Gly Cys Asn Leu Phe Ala Pro Ser Arg Leu Leu Asn Leu Gly Lys Thr
 340 345 350
 Arg Ala Glu Trp Ile Glu Ala Ile Lys Leu Ala Leu Ile Thr Ser Leu
 355 360 365
 Gln Asp Phe Gly Trp Glu Gln Asp Asn Gln Glu Glu Gln Lys Ile Ile
 370 375 380
 Ile Leu Thr Asp Lys Asp Gln Pro Pro Ile Ile Pro Pro Arg Phe Asp
 385 390 395 400
 Leu Thr Thr Pro

<210> 27
 <211> 963
 <212> DNA
 <213> *Chlamydia pneumoniae*

<400> 27
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 gatgctgata ttatggaatg gcagcagatt tgcaatattc tttcaggagt ctgtagcaga 180
 atgagtggaa agttggtttc tttgcagaag gaaacccaag actcttgtca tcaggagcat 240
 gaacgtattc acttacagta tcgggaacag ctatctgctt tggaagaaga atatcgccgt 300
 cgtgaagaag ctaaaaatca agatttagaa aagttacaac aagaaaatac ctgggttgcaa 360
 aatcgccttg ctgagaaatt acaacaaatt cgacaccaa gtgatattat cgacgagata 420
 aaaaaagaac tgcttcaaag tgtacagcga acagaaatta gtgaaggcg tcgtttatgc 480
 tatgagcata aaattaaaca gctggaagaa caactacagc gttatgtttc gcaacacgga 540
 gccccctcta tagagataga agaagacaaa tcttcagccg catatgcaga gatcaaccgt 600
 ttgaagaaaa gtcttataga tttgcaacaa gaaaaagata tttatataaa aacatatcat 660
 tcagagattg ctaagttaag agaaaaatta cagcgacaag aaggagctca aactagctct 720
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 gccatagcct tactcaaga tattgttgag gatcaatatt gtcagcttcg agatctacat 840
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 ggcaaagaac ctgagagtga agtagacgta gtattctcag aatctaaatc tttagggagt 960
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<210> 28
<211> 320
<212> PRT
<213> Chlamydia pneumoniae
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<400> 28

Val Arg Leu Leu Ser Ile Leu Lys Leu His Leu Phe Ser Leu Arg Ser
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Ser Ser Ser Leu Ser Pro His Tyr Tyr His Ser Cys Ser Arg Ser Met
20 25 30

Leu His Leu Leu Cys Arg Trp Lys Asp Ala Asp Ile Met Glu Trp Gln
35 40 45

Gln Ile Cys Asn Ile Leu Ser Gly Val Cys Ser Arg Met Ser Gly Lys
50 55 60

Leu Val Ser Leu Gln Lys Glu Thr Gln Asp Ser Cys His Gln Glu His
65 70 75 80

Glu Arg Ile His Leu Gln Tyr Arg Glu Gln Leu Ser Ala Leu Glu Glu
85 90 95

Glu Tyr Arg Arg Arg Glu Glu Ala Lys Asn Gln Asp Leu Glu Lys Leu
100 105 110

Gln Gln Glu Asn Thr Trp Leu Gln Asn Arg Leu Ala Glu Lys Leu Gln
115 120 125

Gln Ile Arg His Gln Ser Asp Ile Ile Asp Glu Ile Lys Lys Glu Leu
130 135 140

Leu Gln Ser Val Gln Arg Thr Glu Ile Ser Glu Gly Arg Arg Leu Cys
145 150 155 160

Tyr Glu His Lys Ile Lys Gln Leu Glu Glu Gln Leu Gln Arg Tyr Val
165 170 175

Ser Gln His Gly Ala Pro Ser Ile Glu Ile Glu Glu Asp Lys Ser Ser
180 185 190

Ala Ala Tyr Ala Glu Ile Asn Arg Leu Lys Lys Ser Leu Ile Asp Leu
195 200 205

Gln Gln Glu Lys Asp Ile Tyr Ile Lys Thr Tyr His Ser Glu Ile Ala
210 215 220

Lys Leu Arg Glu Lys Leu Gln Arg Gln Glu Gly Ala Gln Thr Ser Ser
225 230 235 240

Glu Val Cys Ser Ile Glu Lys Leu Thr Glu Val Gln Thr Asp Leu Ala
245 250 255

Glu Lys Lys Lys Ala Ile Ala Leu Leu Gln Asp Ile Val Glu Asp Gln
260 265 270

Tyr Cys Gln Leu Arg Asp Leu His Lys Glu Lys Gly Met Ala Met Pro
 275 280 285

Ser Asn Thr Lys Leu Asp His Leu Lys Gly Leu Leu Gly Lys Glu Pro
 290 295 300

Glu Ser Glu Val Asp Val Val Phe Ser Glu Ser Lys Ser Leu Gly Ser
 305 310 315 320

<210> 29

<211> 3258

<212> DNA

<213> Chlamydia pneumoniae

<400> 29

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aagatgtttc atgactgtcg tgcttctgta attatgatta cgacacccgc acgtcttgat 180
gatctctttg aaaatttaag gaccttttta gaccaagctc ctgtagaatt tccctcttct 240
gaaattgatc tctctccaaa attagtgaac atagatgctg tggggaagcg agatcatctt 300
ctttacagct tgaatcagca cagggtcctt atattctgtg tcaactacatt aaaagctctt 360
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gatgtcttag atccagaagc aactacggaa ctctgtaaaa gtttaggata ttctcaggtc 480
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gcgtacacag aagaggcctc tggaggaaac tattctcatt cactattaga ctatttcagc 720
acccctcctc tctatctctt tgataactta gaaattctag aagatgactt tgcggatatt 780
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<210> 30

<211> 1085

<212> PRT

<213> Chlamydia pneumoniae

<400> 30

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Met Ala Met Asp Phe Asn Pro Val Asn Leu Asp Phe Ser Ile Ser Lys
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Glu Phe Lys Glu Glu Thr Leu Pro Leu Leu Leu Glu Asn Ile His Pro
      20              25              30

Gly Ala Thr Ala Phe Leu Ala Ala Lys Met Phe His Asp Cys Arg Ala
      35              40              45

Ser Val Ile Met Ile Thr Thr Pro Ala Arg Leu Asp Asp Leu Phe Glu
      50              55              60

Asn Leu Arg Thr Phe Leu Asp Gln Ala Pro Val Glu Phe Pro Ser Ser
      65              70              75              80

Glu Ile Asp Leu Ser Pro Lys Leu Val Asn Ile Asp Ala Val Gly Lys
      85              90              95

Arg Asp His Leu Leu Tyr Ser Leu Asn Gln His Arg Ala Pro Ile Phe
      100              105              110

Cys Val Thr Thr Leu Lys Ala Leu Leu Glu Lys Thr Arg Ser Pro Gln
      115              120              125

Ala Thr Ser Gln Gln His Leu Asp Leu Ala Val Gly Asp Val Leu Asp
      130              135              140

Pro Glu Ala Thr Thr Glu Leu Cys Lys Ser Leu Gly Tyr Ser Gln Val
      145              150              155              160

Met Leu Thr Ser Glu Lys Gly Glu Phe Ser Cys Arg Gly Gly Ile Val
      165              170              175

Asp Ile Phe Pro Leu Ser Ser Pro Glu Pro Phe Arg Ile Glu Phe Trp
      180              185              190

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Gly	Glu	Lys 195	Ile	Ile	Ser	Ile	Arg 200	Ser	Tyr	Asn	Pro	Ser 205	Asp	Gln	Leu
Ser	Thr 210	Gly	Lys	Val	Ser	Lys 215	Ile	Ser	Ile	Ser	Pro 220	Ala	Tyr	Thr	Glu
Glu 225	Ala	Ser	Gly	Gly	Asn 230	Tyr	Ser	His	Ser	Leu 235	Leu	Asp	Tyr	Phe	Ser 240
Thr	Pro	Pro	Leu	Tyr 245	Leu	Phe	Asp	Asn	Leu 250	Glu	Ile	Leu	Glu	Asp 255	Asp
Phe	Ala	Asp	Ile 260	Ser	Gly	Thr	Leu	Ser 265	Ser	Leu	Pro	Asp	Arg 270	Phe	Phe
Ser	Ile	Gly 275	Thr	Leu	Tyr	Asp	Arg 280	Ile	Ser	Thr	Ser	Asn 285	Gln	Val	Tyr
Phe	Ser 290	Glu	Thr	Pro	Phe	Pro 295	Asn	Val	Lys	Asn	Leu 300	Lys	Glu	Asn	Arg
Val 305	Ile	Ile	Glu	Ala	Phe 310	His	Arg	Asn	Met	Glu 315	Ala	Ser	Arg	Gln	Ala 320
Ile	Pro	Ile	Leu	Tyr 325	Pro	Glu	Gln	Ile	Ile 330	Gln	Asn	Asp	Glu	Asn 335	Pro
Leu	Leu	Ala	Phe 340	Leu	Gln	His	Leu	Gln 345	Glu	Tyr	Met	Pro	Pro 350	His	Gly
Lys	Pro	Leu 355	Lys	Leu	Ala	Ile	Tyr 360	Ser	Thr	Lys	Thr	Lys 365	Ser	Leu	Lys
Glu	Ala 370	Arg	Ala	Leu	Ala	Glu 375	Thr	Val	Ala	Arg	Gly 380	Asp	Val	Glu	Ile
Tyr 385	Glu	Lys	Thr	Gly	Asn 390	Leu	Thr	Ser	Ser	Phe 395	Ala	Leu	Val	Asn	Glu 400
Ala	Phe	Ala	Ala	Ile 405	Ser	Leu	Ser	Glu	Phe 410	Ala	Ser	Thr	Lys	Val 415	Leu
Arg	Arg	Gln	Lys 420	Gln	Arg	Thr	His	Phe 425	Ser	Val	Thr	Thr	Glu 430	Glu	Val
Phe	Val	Pro 435	Ile	Pro	Gly	Glu	Thr 440	Val	Val	His	Ile	His 445	Asn	Gly	Ile
Gly	Lys 450	Phe	Leu	Gly	Ile	Glu 455	Lys	Lys	Pro	Asn	His 460	Leu	Asn	Ile	Glu
Thr 465	Asp	Tyr	Leu	Val	Leu 470	Glu	Tyr	Ala	Asp	Lys 475	Ala	Arg	Leu	Tyr	Val 480
Pro	Ser	Asn	Gln 485	Ala	Tyr	Leu	Ile	Ser	Arg 490	Tyr	Val	Gly	Thr	Ser 495	Asp

Lys	Ala	Ala	Asp	Leu	His	His	Leu	Asn	Ser	Ser	Lys	Trp	Lys	Arg	Ser		
			500					505					510				
Arg	Asp	Leu	Thr	Glu	Lys	Ser	Leu	Ile	Val	Tyr	Ala	Glu	Lys	Leu	Leu		
		515					520					525					
Gln	Leu	Glu	Ala	Gln	Arg	Ser	Thr	Thr	Pro	Ala	Phe	Val	Tyr	Pro	Pro		
	530					535					540						
His	Gly	Glu	Ser	Val	Ile	Lys	Phe	Ala	Glu	Thr	Phe	Pro	Tyr	Glu	Glu		
545					550					555					560		
Thr	Pro	Asp	Gln	Leu	Lys	Thr	Ile	Asp	Gln	Ile	Tyr	Asn	Asp	Met	Met		
				565					570					575			
Ser	Pro	Lys	Leu	Met	Asp	Arg	Leu	Ile	Cys	Gly	Asp	Ala	Gly	Phe	Gly		
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Lys	Thr	Glu	Val	Ile	Met	Arg	Ala	Ala	Val	Lys	Ala	Val	Cys	Asp	Gly		
		595					600					605					
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His	Tyr	Glu	Thr	Phe	Lys	Glu	Arg	Met	Ala	Gly	Leu	Pro	Ile	Glu	Ile		
625					630					635					640		
Ala	Val	Leu	Ser	Arg	Phe	Ser	Gln	Ala	Lys	Val	Gln	Lys	Leu	Ile	Cys		
				645					650					655			
Glu	Gln	Val	Ala	Ser	Gly	Gln	Ile	Asp	Ile	Ile	Ile	Gly	Thr	His	Lys		
			660					665					670				
Leu	Ile	Asn	Lys	Ser	Leu	Glu	Phe	Lys	Asn	Pro	Gly	Leu	Leu	Ile	Ile		
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Asp	Glu	Glu	Gln	Arg	Phe	Gly	Val	Lys	Val	Lys	Asp	Asn	Leu	Lys	Glu		
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Ala	Met	Pro	Pro	Leu	Asp	Arg	Leu	Pro	Val	Ser	Thr	Phe	Val	Met	Glu		
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His	Asn	Thr	Glu	Thr	Leu	Thr	Ala	Ala	Leu	Arg	His	Glu	Leu	Leu	Arg		
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785					790					795					800		

Ala His Gly Gln Met Gly Ala Glu Asp Leu Ser Asn Ile Phe Thr Lys
805 810 815

Phe Lys Asn Gln Lys Thr Asp Ile Leu Val Ala Thr Ala Leu Ile Glu
820 825 830

Asn Gly Ile Asp Ile Pro Asn Ala Asn Thr Ile Leu Ile Asp His Ala
835 840 845

Asp Lys Phe Gly Met Ala Asp Leu Tyr Gln Met Lys Gly Arg Val Gly
850 855 860

Arg Trp Asn Lys Lys Ala Tyr Cys Tyr Phe Leu Val Pro His Leu Asp
865 870 875 880

Arg Leu Ser Gly Pro Ala Ala Lys Arg Leu Ala Ala Leu Asn Lys Gln
885 890 895

Glu Tyr Gly Gly Gly Met Lys Ile Ala Leu His Asp Leu Glu Ile Arg
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Gly Ala Gly Asn Ile Leu Gly Thr Asp Gln Ser Gly His Ile Gly Thr
915 920 925

Ile Gly Phe Asn Leu Tyr Cys Lys Leu Leu Lys Lys Ala Val Ser Ala
930 935 940

Leu Lys Lys His Thr Ser Pro Leu Leu Phe Asn Asp Asp Val Lys Ile
945 950 955 960

Glu Phe Pro Tyr Asn Ser Arg Ile Pro Asp Thr Tyr Ile Glu Thr Gly
965 970 975

Ser Met Arg Ile Glu Phe Tyr Gln Lys Ile Gly Asn Ala Glu Ser Ser
980 985 990

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995 1000 1005

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Phe Ala Leu Gln His Gly Ile Ser Ser Ile Lys Gly Thr Ala Asn Ala
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<210> 31

<211> 1947

<212> DNA

<213> Chlamydia pneumoniae

<400> 31

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<210> 32

<211> 648

<212> PRT

<213> Chlamydia pneumoniae

<400> 32

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                20                25                30

Ile Lys Lys Met Met Asp Lys Leu Ile Glu Tyr His Val Asp Ala Gln
 35                40                45

Glu Val Ser Thr Asp Ile Leu Ser Arg Ser Leu Ser Ser Tyr Ile Gln
 50                55                60

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Ser	Phe	Asp	Pro	His	Lys	Ser	Tyr	Leu	Ser	Asn	Gln	Glu	Val	Ala	Val	65	70	75	80
Phe	Leu	Gln	Ser	Pro	Glu	Thr	Lys	Lys	Arg	Leu	Leu	Lys	Asn	Tyr	Lys	85	90	95	
Ala	Gly	Asn	Phe	Ala	Ile	Tyr	Arg	Asn	Ile	Asn	Gln	Leu	Ile	His	Glu	100	105	110	
Ser	Ile	Leu	Arg	Ala	Arg	Gln	Trp	Arg	Asn	Glu	Trp	Val	Lys	Asn	Pro	115	120	125	
Lys	Glu	Leu	Val	Leu	Glu	Ala	Ser	Ser	Tyr	Gln	Ile	Ser	Lys	Gln	Pro	130	135	140	
Met	Gln	Trp	Ser	Lys	Ser	Leu	Asp	Glu	Val	Lys	Gln	Arg	Gln	Arg	Ala	145	150	155	160
Leu	Leu	Leu	Ser	Tyr	Leu	Ser	Leu	His	Leu	Ala	Gly	Ala	Ser	Ser	Ser	165	170	175	
Arg	Tyr	Glu	Gly	Lys	Glu	Glu	Gln	Leu	Ala	Ala	Leu	Cys	Leu	Arg	Gln	180	185	190	
Ile	Glu	Asn	His	Glu	Asn	Val	Tyr	Leu	Gly	Ile	Asn	Asp	His	Gly	Val	195	200	205	
Ala	Met	Asp	Arg	Asp	Glu	Glu	Ala	Tyr	Gln	Phe	His	Ile	Arg	Val	Val	210	215	220	
Lys	Ala	Leu	Ala	His	Ser	Leu	Asp	Ala	His	Thr	Ala	Tyr	Phe	Ser	Lys	225	230	235	240
Asp	Glu	Ala	Leu	Ala	Met	Arg	Ile	Gln	Leu	Glu	Lys	Gly	Met	Cys	Gly	245	250	255	
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Asp	Ile	Ile	Tyr	Arg	Val	Asp	Gly	Lys	Asp	Ile	Glu	His	Leu	Ser	Phe	290	295	300	
Arg	Gly	Val	Leu	Asp	Cys	Leu	Arg	Gly	Gly	His	Gly	Ser	Thr	Val	Val	305	310	315	320
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Glu	Lys	Ile	Leu	Leu	Glu	Asp	Arg	Arg	Val	Asp	Val	Ser	Tyr	Glu	Pro	340	345	350	
Tyr	Gly	Asp	Gly	Val	Ile	Gly	Lys	Val	Thr	Leu	His	Ser	Phe	Tyr	Glu	355	360	365	

Gly Glu Asn Gln Val Ser Ser Glu Gln Asp Leu Arg Arg Ala Ile Gln
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 Gly Leu Lys Glu Lys Asn Leu Leu Gly Leu Val Leu Asp Ile Arg Glu
 385 390 395 400
 Asn Thr Gly Gly Phe Leu Ser Gln Ala Ile Lys Val Ser Gly Leu Phe
 405 410 415
 Met Thr Asn Gly Val Val Val Val Ser Arg Tyr Ala Asp Gly Thr Met
 420 425 430
 Lys Cys Tyr Arg Thr Val Ser Pro Lys Lys Phe Tyr Asp Gly Pro Leu
 435 440 445
 Ala Ile Leu Val Ser Lys Ser Ser Ala Ser Ala Ala Glu Ile Val Ala
 450 455 460
 Gln Thr Leu Gln Asp Tyr Gly Val Ala Leu Val Val Gly Asp Glu Gln
 465 470 475 480
 Thr Tyr Gly Lys Gly Thr Ile Gln His Gln Thr Ile Thr Gly Asp Ala
 485 490 495
 Ser Gln Asp Asp Cys Phe Lys Val Thr Val Gly Lys Tyr Tyr Ser Pro
 500 505 510
 Ser Gly Lys Ser Thr Gln Leu Gln Gly Val Lys Ser Asp Ile Leu Ile
 515 520 525
 Pro Ser Leu Tyr Ala Glu Asp Arg Leu Gly Glu Arg Phe Leu Glu His
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 Asp Leu Asp Thr Gln Thr Arg Pro Trp Phe Gln Lys Tyr Tyr Leu Pro
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 595 600 605
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<210> 33

<211> 1323

<212> DNA

<213> Chlamydia pneumoniae

<400> 33

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<210> 34

<211> 440

<212> PRT

<213> Chlamydia pneumoniae

<400> 34

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Phe Val Val Val Ser Ala Ile Ala Gly Val Thr Asp Leu Leu Val Asp
      35              40              45

Phe Cys Ser Ser Ser Leu Arg Glu Arg Glu Glu Val Leu Arg Lys Ile
      50              55              60

Glu Gly Lys His Glu Glu Ile Val Lys Asn Leu Ala Ile Pro Phe Pro
      65              70              75              80

Val Ser Thr Trp Thr Ser Arg Leu Leu Pro Tyr Leu Gln His Leu Glu
      85              90              95

Ile Ser Asp Leu Asp Phe Ala Arg Ile Leu Ser Leu Gly Glu Asp Ile
      100              105              110

Ser Ala Ser Leu Val Arg Ala Val Cys Ser Thr Arg Gly Trp Asp Leu
      115              120              125

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Glu	Leu	Asn	Gln	Pro	Ser	Tyr	Ile	Ile	Gln	Gly	Phe	Ile	Gly	Ser	Asn		
				165					170					175			
Gly	Leu	Gly	Glu	Thr	Val	Leu	Leu	Gly	Arg	Gly	Gly	Ser	Asp	Tyr	Ser		
			180					185					190				
Ala	Thr	Leu	Ile	Ala	Glu	Leu	Ala	Arg	Ala	Thr	Glu	Val	Arg	Ile	Tyr		
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Thr	Asp	Val	Asn	Gly	Ile	Tyr	Thr	Met	Asp	Pro	Lys	Val	Ile	Ser	Asp		
	210					215					220						
Ala	Gln	Arg	Ile	Pro	Glu	Leu	Ser	Phe	Glu	Glu	Met	Gln	Asn	Leu	Ala		
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Arg	Ala	Gly	Ile	Pro	Ile	Phe	Val	Thr	Ser	Thr	Phe	Asp	Pro	Glu	Lys		
			260					265					270				
Gly	Gly	Thr	Trp	Val	Tyr	Ala	Val	Asp	Lys	Ser	Val	Ser	Tyr	Glu	Pro		
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Arg	Ile	Lys	Ala	Leu	Ser	Leu	Ser	Gln	Tyr	Gln	Ser	Phe	Cys	Ser	Val		
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Asp	Tyr	Thr	Val	Leu	Gly	Cys	Gly	Gly	Leu	Glu	Glu	Ile	Leu	Gly	Ile		
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				325					330					335			
Val	Val	Gly	Phe	Val	Met	Asp	Asp	Asp	Ile	Ile	Ser	Gln	Glu	Ala	Gln		
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Glu	His	Leu	Val	Asp	Val	Leu	Ser	Leu	Ser	Ser	Val	Thr	Arg	Leu	His		
	355						360					365					
His	Ser	Val	Ala	Leu	Ile	Thr	Met	Ile	Gly	Asp	Asn	Leu	Ser	Ser	Pro		
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Lys	Val	Val	Ser	Thr	Ile	Thr	Glu	Lys	Leu	Arg	Gly	Phe	Gln	Gly	Pro		
385					390					395					400		
Val	Phe	Cys	Phe	Cys	Gln	Ser	Ser	Met	Ala	Leu	Ser	Phe	Val	Val	Ala		
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Ser	Glu	Leu	Ala	Glu	Gly	Ile	Ile	Glu	Glu	Leu	His	Asn	Asp	Tyr	Val		
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<211> 933
<212> DNA
<213> Chlamydia pneumoniae

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<211> 310
<212> PRT
<213> Chlamydia pneumoniae

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35 40 45
Ala Leu Arg Ala Lys Gly Ala Ile Phe Val Glu Glu Leu Val Asp Val
50 55 60
Pro Glu Gly Glu Arg Val Ile Tyr Ser Ala His Gly Ile Pro Pro Ser
65 70 75 80
Val Arg Ala Glu Ala Lys Ala Arg Lys Leu Ile Asp Ile Asp Ala Thr
85 90 95
Cys Gly Leu Val Thr Lys Val His Ser Ala Ala Lys Leu Tyr Ala Ser
100 105 110
Lys Gly Tyr Lys Ile Ile Leu Ile Gly His Lys Lys His Val Glu Val
115 120 125

Ile Gly Ile Val Gly Glu Val Pro Glu His Ile Thr Val Val Glu Lys
 130 135 140
 Val Ala Asp Val Glu Ala Leu Pro Phe Ser Ser Asp Thr Pro Leu Phe
 145 150 155 160
 Tyr Ile Thr Gln Thr Thr Leu Ser Leu Asp Asp Val Gln Glu Ile Ser
 165 170 175
 Ser Ala Leu Leu Lys Arg Tyr Pro Ser Ile Ile Thr Leu Pro Ser Ser
 180 185 190
 Ser Ile Cys Tyr Ala Thr Thr Asn Arg Gln Lys Ala Leu Arg Ser Val
 195 200 205
 Leu Ser Arg Val Asn Tyr Val Tyr Val Val Gly Asp Val Asn Ser Ser
 210 215 220
 Asn Ser Asn Arg Leu Arg Glu Val Ala Leu Arg Arg Gly Val Pro Ala
 225 230 235 240
 Asp Leu Ile Asn Asn Pro Glu Asp Ile Asp Thr Asn Ile Val Asn His
 245 250 255
 Ser Gly Asp Ile Ala Met Thr Ala Gly Ala Ser Thr Pro Glu Asp Val
 260 265 270
 Val Gln Ala Cys Ile Arg Lys Leu Ser Ser Leu Ile Pro Gly Leu Gln
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<210> 37

<211> 882

<212> DNA

<213> Chlamydia pneumoniae

<400> 37

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<210> 38
 <211> 293
 <212> PRT
 <213> Chlamydia pneumoniae

<400> 38

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          20           25           30

Gly Thr Tyr Ile Val Val Lys Arg Ile Val Ser Ile Ser Gly Ser Ile
          35           40           45

Ser His Ala Ile Leu Gly Gly Ile Gly Leu Thr Leu Trp Ile Gln Tyr
          50           55           60

Lys Leu His Leu Ser Phe Phe Pro Met Tyr Gly Ala Ile Val Gly Ala
          65           70           75           80

Ile Phe Leu Ala Leu Cys Ile Gly Lys Ile His Leu Lys Tyr Gln Glu
          85           90           95

Arg Glu Asp Ser Leu Ile Ala Met Ile Trp Ser Val Gly Met Ala Ile
          100          105          110

Gly Ile Ile Phe Ile Ser Arg Leu Pro Thr Phe Asn Gly Glu Leu Ile
          115          120          125

Asn Phe Leu Phe Gly Asn Ile Leu Trp Val Thr Pro Ser Asp Leu Tyr
          130          135          140

Ser Leu Gly Ile Phe Asp Leu Leu Val Leu Gly Ile Val Val Leu Cys
          145          150          155          160

His Thr Arg Phe Leu Ala Leu Cys Phe Asp Glu Arg Tyr Thr Ala Leu
          165          170          175

Asn His Cys Ser Val Gln Leu Trp Tyr Phe Leu Leu Leu Val Leu Thr
          180          185          190

Ala Ile Thr Ile Val Met Leu Ile Tyr Val Met Gly Thr Ile Leu Met
          195          200          205

Leu Ser Met Leu Val Leu Pro Val Ala Ile Ala Cys Arg Phe Ser Tyr
          210          215          220

Lys Met Thr Arg Ile Met Phe Ile Ser Val Leu Leu Asn Ile Leu Cys
          225          230          235          240

Ser Phe Ser Gly Ile Cys Ile Ala Tyr Cys Leu Asp Phe Pro Val Gly
          245          250          255

Pro Thr Ile Ser Leu Leu Met Gly Leu Gly Tyr Thr Ala Ser Leu Cys
          260          265          270

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Val Lys Lys Arg Tyr Asn Pro Ser Thr Pro Ser Pro Val Ser Pro Glu
 275 . 280 285

Ile Asn Thr Asn Val
 290

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<220>
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<400> 39
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<210> 40
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<220>
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<210> 41
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<220>
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 cacaacgtgt tcatatgaaa atcaccacag tcaaaac 37

<210> 42
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<210> 43
 <211> 30

<212> DNA
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 gggaattcca tatgctccgt ttcttcgctg 30

 <210> 44
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 <212> DNA
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 <210> 45
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 ccgctaccgc catatgtcat ctctgt 27

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 <220>
 <223> Description of Artificial Sequence: Primer

 <400> 46
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29

<210> 49
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<223> Description of Artificial Sequence: Primer

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catgggggac atatggctgt tcaatctat

29

<210> 50
<211> 34
<212> DNA
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<223> Description of Artificial Sequence: Primer

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34

<210> 51
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<223> Description of Artificial Sequence: Primer

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gttggaattc atatgagcag ttcggaagtt g

31

<210> 52
<211> 32
<212> DNA
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<223> Description of Artificial Sequence: Primer

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gggcctcgag ttactcaatc atctgacatc tg

32

<210> 53
<211> 31
<212> DNA
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<220>

<223> Description of Artificial Sequence: Primer

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gtagttaatc catgggaact cctatatctg g

31

<210> 54
<211> 33
<212> DNA
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<223> Description of Artificial Sequence: Primer

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33

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<223> Description of Artificial Sequence: Primer

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31

<210> 56
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<210> 65

<211> 35

<212> DNA

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<223> Description of Artificial Sequence: Primer

<400> 65

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35

<210> 66

<211> 37

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer

<400> 66

ctacgtagga ctcgagactc cctaaagatt tagattc

37

<210> 67

<211> 39

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 <210> 71
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 <400> 71
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<210> 72
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<223> Description of Artificial Sequence: Primer

<400> 72
gtaaatgcat gatgcggccg ccgtggcgac tatagc

36

<210> 73
<211> 36
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<223> Description of Artificial Sequence: Primer

<400> 73
ctttaggttaa ttcatatgag aaaacttatt ttatgc

36

<210> 74
<211> 37
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<223> Description of Artificial Sequence: Primer

<400> 74
gtaagcctaa actcgagaga acaacggagt tcttttg

37

<210> 75
<211> 37
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<220>

<223> Description of Artificial Sequence: Primer

<400> 75
gcctccgtag ctcatatggt tatgggaacc tatatcg

37

<210> 76
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<220>

<223> Description of Artificial Sequence: Primer

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35

<210> 77

<211> 10

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: His tag

<400> 77

His His His His His His His His His His
1 5 10